POISONOUS DRIED BEEF.

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[PLATE III.]

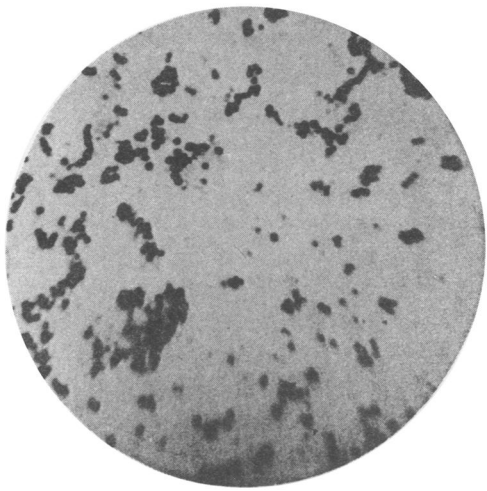
Some time this summer numerous cases of poisoning—it is said about sixty, and two of them with a fatal termination—occurred in the city of Momence, on the Kankakee River, in Kankakee County, Illinois.

The physicians of Momence and of Kankakee, who were called in, and investigated these cases of wholesale poisoning, soon came to the conclusion that dried beef, procured from one of the Chicago (Jackson street) packing-houses, constituted the cause.

The newspapers, as is usually the case, published every item they could get hold of, and the excitement, not only in Momence, but also in the surrounding country, became very great. Samples of the suspected beef were sent for examination to several chemists and microscopists in Chicago. The reporters of Chicago's enterprising newspapers, ever on the alert when a piece of news can be obtained, soon interviewed these chemists and microscopists, and, obtaining some facts, but probably not enough to make up a spicy article, drew largely on their imagination, and thus inaccurate, and even erroneous accounts were published; for instance, one chemist was reported as having found all possible kinds of Bacteria, *Bacillus anthracis* and *Spirilla* included.

Through the kindness of Dr. H. E. Hildebrand, of Chicago, a sample of the poisonous dried beef was also sent to me. Dr. Hildebrand had obtained the same from a conductor of the E. I. R. R., who had taken it off the breakfast table of one of the poisoned families in Momence, consequently the sample sent me was genuine. It arrived by mail, and was carefully wrapped up in paraffined paper. The sample of beef, thus coming into my possession, was in chips, and of a rather dark color; but as dried beef, even the best, usually turns

PLATE III.



darker, after it has been chipped a day or two, I cannot consider this darker color as something very abnormal. According to the reports in the Chicago papers, Prof. Mariner, of Chicago, one of the chemists who examined samples of the poisonous beef, did not observe any abnormal odor. I did, but find it difficult to describe the same. It was very similar, though not identical, to the odor which usually emanates from certain small, dried fishes (herrings) known as bloaters, and often kept for sale in grocery-stores, when these fish are commencing to become rotten.

My examination, exclusively microscopical, was made in the following way: I took a test-tube, filled it half full with boiled water, then boiled the water in the flame of a spirit-lamp till it bubbled over, and rinsed the test-tube. After that I immediately filled it again about half full with boiled water, closed the opening with a plug of cotton, and boiled the water till about one-third of it had evaporated. Believing water and test-tube now to be perfectly sterilized, or at least destitute of any bacteritic growth, I allowed the water to cool to about 100° F., then carefully, for a moment, lifted the plug of cotton, and dropped into the test-tube a small piece of the dried beef for the purpose of softening the same. Three test-tubes, which I will designate as No. 1, No. 2 and No. 3, were prepared in the same way. After two hours I opened test-tube No. 1, took out the piece of beef and wiped (moistened) with its wet surfaces, several clean $\frac{6}{8}$ in. covers, kept in readiness. These covers, thus wetted on one side, were then treated, stained and mounted in balsam, after Dr. Koch's method. When I passed them through the flame of a spirit-lamp the odor, already described, became very distinct. Some of the covers, or rather the material deposited on their surface, were stained with vesuvine to be afterwards photographed, some with methyl-violet, and some with gentiana-violet. After they had been mounted in balsam without applying heat, I found, on examination, on every slide, innumerable Micrococci, and nothing else—at any rate *no other* Bacteria (see photo-micrograph). These Micrococci are rather large, at least larger than those of swine-plague, and measure from 0.8 to 1.0μ

The small piece of beef, after it had thus been made use of in mounting the adhering Micrococci, was put back into test-tube No.

1, but the plug of cotton was not replaced; consequently the tube remained open. The small piece of beef in tube No. 2 was taken out after it had been four hours immersed; was torn into still smaller pieces, which were placed on clean $\frac{6}{8}$ in. covers, and on them teased out with needles. This done, all particles of beef that could be taken hold of with a delicate forceps, were removed, and then the covers were passed through the flame of a spirit-lamp, and stained and mounted in the same way as the others. Result: the same as before, except that the slides contained here and there small particles of muscular fiber, on which transverse striæ could not be recognized.

From tube No. 3 the piece of beef was removed immediately after, or within about four and a half hours after it had been put in. It had become soft, and as it was intended to mount it in substance, it was put between two strong slides, to be squeezed by pressure. The slides were then tied together at each end, and after some staining fluid (methyl-violet) had been allowed to run in between, placed in a bottle with alcohol, and from there, after a few days, transferred to a bottle with turpentine. When sufficiently anhydrated and made transparent, the pieces were mounted in balsam.

When examined, it was found that the muscular fibers had in so far degenerated in this texture (presented a broken-down appearance) as not to show, or to show but very indistinctly, the transverse striæ. Numerous Micrococci, however, could be seen, wherever the same were not hidden by the muscular fibers, but no other Bacteria could be found. I also mounted some of the water in which the beef had been soaked, and which had become quite turbid, but as the result was the same as with the other slides—innumerable Micrococci, here and there a very small remnant of muscular fiber, and nothing else—it will not be necessary to make any further mentioning of it.

Two and three days later some of the fluid, and now very turbid, contents of tube No. 1, to which the piece of beef had been transferred, was mounted on covers in the same way as described. The contents of this (open) tube had become putrid, and had a decidedly offensive smell, entirely different from that first observed. When these slides were examined, various kinds of Bacteria,

namely, Micrococci, apparently identical to those found before, two kinds of *Bacilli*, *Bacterium lineola* and others; in fact, every *Bacterium* of which germs may have been existing in the atmosphere were found to be present, but I was not able to identify any of these *Bacilli* as *Bacillus anthracis*, said to have been found by Professor Mariner.

Professor Long, of the Chicago Medical College, also made an examination, microscopical and chemical, of the same dried beef, and, according to what he told me when I met him in Chicago, the result of his microscopical examination proved to be the same as that obtained by me. He, however, expressed the opinion that some ptomaïnes, which he found in his chemical analysis, constitute the poisonous principle. He probably is correct, but if he is, that is, if the Micrococci present in such a great abundance—thus colonies on the surface of the muscular fibers were visible to the naked eye—do not themselves constitute the poisonous principle, the fact that a great many Bacteria possess fermenting properties, and that Bacteria, very likely, are the producers and developers of ptomaïnes, would go far to show that the Micrococci must constitute the cause (at least the mediate cause) of the poisonous properties. At any rate, it seems to me, the penetrating and characteristic odor developing on and arising from the Micrococci on the covers, when passed through the flame of the spirit-lamp, very strongly points that way.

The question may be asked: Where did the beef come from, or how did it happen to be poisonous? If the newspaper reports on Prof. Mariner's investigations were telling the truth, one might be tempted to conclude that it was derived from an animal afflicted with anthrax, but such cannot be, because in over thirty slides, carefully examined, not a solitary *Bacillus anthrasis* could be found. It is quite certain, however, that the animal, or animals, from which the beef was taken was, or were, diseased, but that disease was neither anthrax, pleuro-pneumonia, so called black-leg or symptomatic-anthrax, actinomycosis, nor any other known epizoötic or enzoötic disease of cattle. Knowing, however, the regulations and prevailing practices in the Chicago stock-yards, and taking into consideration the condition of the beef, the presence of innumerable Micrococci and of ptomaïnes, etc., I believe I am not mistaken

when I say that the beef in question is undoubtedly the flesh of an animal, or of animals, that was, or were, trampled upon in the cars, thus bruised and crippled, and in a dying condition when slaughtered, or of an animal that was killed while in a highly frenzied condition.

Cases of frenzy occur quite often among cattle driven from the stock-yards to Archer avenue, but the health officers seem to pay no attention to frenzied cattle, although they ought to know that the meat of a frenzied animal is sometimes—not always—exceedingly poisonous. So, for instance, there are many cases on record in which venison from a deer, chased to death by dogs, has proved to be poisonous.

Cases in which cattle, and other animals, too, are trampled to death, or nearly to death, in the cars, are very frequent; and still, the health officers, it seems, permit such animals to be slaughtered and to be used for human food. They allow every crippled and bruised animal, if it only breathes, to be hauled through the gate of the stock-yards, and to be carted to the slaughter-houses. But if they espy a steer with a so-called lumped jaw (actinomycosis), a purely local disease, they are very quick in confiscating the animal, notwithstanding that not a solitary instance is on record in which the consumption of the meat of such an animal has been productive of any bad results whatever. On the other hand, cases of swine-plague, unless very conspicuous, are allowed to pass, and no attention whatever is paid to trichinosis, notwithstanding that of nearly 10,000 hogs examined almost 5 per cent., and not a trifle over 2 per cent., as the *late* Commissioner of Agriculture has seen fit to publish, were found to be affected with trichinosis. The percentage might have been found still higher, if the majority of the hogs examined had been aged animals, and not pigs, about a year, or less than a year of age. Further, the most shameful adulteration of other animal products, such as lard and butter, is notorious, and carried on every day on a gigantic scale, and in open daylight, but the health officers pay no attention to it, whatever. By doing so they might offend some of Chicago's millionaires, and that would not do. It is far safer to condemn a steer with a so-called lumped jaw; —it only hurts a farmer.

Another question may be asked, namely: How is it that the meat of a frenzied animal, or of an animal that has undergone great suffering by being trampled upon in the cars, or being chased to death, is sometimes, but not always, poisonous? I think it can easily be explained if it is admitted that the poisonous properties are of a bacteritic origin.

The Micrococci, which I have to accuse as the cause or as the producers of the poisonous principle, are incidental parasites, and not always, and not everywhere present. But if present, for instance, in a dirty railroad car, in a slaughter-house, or in a meat-market, etc., as the case may be, they find an exceedingly fertile soil in the organism of an animal whose tissues are in a congested, bruised, or broken-down and highly feverish condition. For it is a well-known fact that all, or nearly all pathogenic Bacteria, but particularly those which must be classed among the incidental parasites, are powerless to cause mischief unless the animal organism offers suitable conditions for their development and propagation.